

<b>SOLICITED PROPOSAL APPLICATION FOR SPACE LIFE SCIENCES AND SPACE SCIENCES</b> IN RESPONSE TO ANNOUNCEMENT ILSRA-2001		LEAVE BLANK <hr/> NUMBER <hr/> REVIEW GROUP <hr/> DATE RECEIVED <hr/>	
PLEASE FOLLOW INSTRUCTIONS CAREFULLY			
1. COMPLETE TITLE OF PROJECT			
2. PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR (First, middle, and last name; degrees; position)			
3. COMPLETE MAILING ADDRESS			
Internal Mail Code or Location Office or Organization Division Agency/Center, Company, or Institution Street or P.O. Box City, State Zip Code			
4. TELEPHONE NUMBER (area code, number, extension)		5. CONGRESSIONAL DISTRICT (U.S. ONLY)	
FAX NUMBER E-MAIL ADDRESS		6. SOCIAL SECURITY # (U.S. ONLY)	
7. THIS PROPOSAL IS: <input type="checkbox"/> NEW <input type="checkbox"/> RENEWAL <input type="checkbox"/> REVISED			
8. HAS THIS PROPOSAL (OR SIMILAR REQUEST) BEEN SUBMITTED TO ANY OTHER AGENCY? <input type="checkbox"/> No <input type="checkbox"/> Yes    IF YES, SPECIFY AGENCY AND YEAR SUBMITTED:			
9. HUMAN SUBJECTS		10. VERTEBRATE ANIMALS	
9a. <input type="checkbox"/> No <input type="checkbox"/> Yes		10a. <input type="checkbox"/> No <input type="checkbox"/> Yes	
9b. Exemption # or IRB Approval Date:		10b. ACUC Approval Date:	
9c. Assurance of Compliance #:		10c. PHS Animal Welfare Assurance #:	
11. CO-INVESTIGATORS (First, middle, and last name; degrees)		12. CO-INVESTIGATOR'S ORGANIZATION	
13. DATES OF ENTIRE PROPOSED PROJECT PERIOD		14. COSTS REQUESTED FOR FIRST 12-MONTH BUDGET PERIOD	
From:		14a. Direct Costs    14b. Total Costs	
Through:		15. COSTS REQUESTED FOR ENTIRE PROPOSED PROJECT PERIOD	
		15a. Direct Costs    15b. Total Costs	
16. APPLICANT ORGANIZATION (Organization Name)			
17. TYPE OF ORGANIZATION (U.S. ONLY)			
<input type="checkbox"/> Non Profit <input type="checkbox"/> For Profit (General) <input type="checkbox"/> For Profit (Small Business) <input type="checkbox"/> Public, Specify: <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Local			
18. ORGANIZATION OFFICIAL TO BE NOTIFIED IF AN AWARD IS MADE (Name, title, address, and telephone number)		19. OFFICIAL SIGNING FOR APPLICANT ORGANIZATION (Name, title, and telephone number)	
20. PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR ASSURANCE:		SIGNATURE OF PERSON NAMED IN 2	
I agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if a grant is awarded as a result of this application. Willful provision of false information is a criminal offense (U.S. Code, Title 18, Section 1001).		(In ink; "Per" signature not acceptable.) <div style="border: 1px solid black; width: 100px; height: 20px; margin-top: 5px;"></div>	
21. CERTIFICATION AND ACCEPTANCE: By submitting the proposal identified in this Cover Sheet/Proposal Summary in response to ILSRA-2001, the Authorizing Official of the proposing institution (or the individual proposer if there is no proposing institution): 1) certifies that the statements made in this proposal are true and complete to the best of his/her knowledge; 2) agrees to accept the obligations to comply with the sponsoring agency award terms and conditions if an award is made as a result of this proposal; and 3) if the applicant organization is an entity of the United States of America, confirms compliance with all provisions, rules, and stipulations set forth in the three Certifications contained in this ILSRA [namely, i) Certification Regarding Debarment, Suspension, and Other Responsibility Matters Primary Cover Transactions, ii) Certification Regarding Lobbying, and iii) Certification of Compliance with the NASA Regulations Pursuant to Nondiscrimination in Federally Assisted Programs]. Willful provision of false information in this proposal and/or its supporting documents, or in reports required under an ensuing award, is a criminal offense (U.S. Code, Title 18, Section 1001).		SIGNATURE OF PERSON NAMED IN 19 (or person named in 2, if there is no proposing institution) (In ink; "Per" signature not acceptable.)	
		<div style="border: 1px solid black; width: 100px; height: 20px; margin-top: 5px;"></div>	

**PROPOSAL ABSTRACT**

**Principal Investigator:** \_\_\_\_\_

**Co-Investigators:** \_\_\_\_\_

**Proposal Title:** \_\_\_\_\_

**Abstract**

Prepare a brief description of the application stating the broad, long-term objectives and specific aims of the proposed work. Describe concisely the research design and methods for achieving these objectives and aims. This abstract is meant to serve as a succinct and accurate description of the proposed work when separated from this application. Limit abstract to 300 words or fewer.

## Space Flight Experiment Requirements Summary

In addition to the actual proposal, Form C is required for the Flight Feasibility Review. This form has been designed for a description of all preflight, inflight and postflight components of the flight experiment. Form C consists of three sections:

- I. a general section to be completed for all flight proposals,
- II. a section to be completed only for experiments that require human subjects, and
- III. a section to be completed only for experiments that require non-human specimens.

If an experiment requires both human and non-human specimens, the entire form must be completed. If no specimens are required (e.g., radiation dosimetry), complete Part 1 and other applicable hardware and procedures questions. If the proposal consists of distinct segments with different requirements, fill out multiple forms to fully describe all segments. **Form C is mandatory for flight experiments.** Flight experiment proposals submitted without Form C completed will not be evaluated.

Please read the questions carefully and keep answers brief but thorough, ensuring that all requested information has been provided. Expand tables/response space as needed. Downloading the RTF file is the most effective way to complete this form.

## Part I: General Information

1. Principal Investigator name: \_\_\_\_\_

2. Proposal title: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Duration of flight experiment

- a. Minimum number of days in flight:
- b. Desired number of days in flight:

4. Describe the types of procedures required for the inflight portion of the experiment. List each type of procedure separately (e.g., blood sample, record EKG, fix culture, etc.).

5. Storage of equipment and supplies other than animal/plant/specimen habitats (for all flight experiments)

Is temperature control of equipment/supplies needed:	Yes	No	Not Applicable	Not Known	Temperature (°C)	Estimated Volume (cm <sup>3</sup> )
-- for launch?						
-- in flight?						
-- for return?						

6. Hazardous materials and controlled/radioactive substances (for all flight experiments)

Add more lines if necessary.

Material	Estimated Volume (cm <sup>3</sup> )	Usage Time Period (e.g., Preflight, Inflight, Postflight)
1.		
2.		
3.		
4.		
5.		

## **Part II: Research Involving Crewmembers as Subjects**

### **7. Subjects**

- a. Number of subjects required for statistical significance:
- b. Special requirements (e.g., gender, age, etc.):
- c. Are inflight procedures needed?
- d. Are pre- and postflight procedures needed?

**8. List all human subject restrictions (e.g., specific dietary regimens, fluid intake regulation, work/rest cycles, exercise, etc.). Indicate the impact on scientific outcome if restrictions cannot be met.**

**9. Is loading of experiment supplies or equipment less than 90 hours before launch required? If so, explain why.**

**10. Is removal of the experiment samples, data, or equipment less than 24 hours after landing required? If so, explain why.**

**11. What procedures will the crew need to learn in order to perform their role as subjects for the experiment?**

List and briefly describe each procedure separately. Be sure to rate the difficulty of learning each procedure (1= easy; 10= difficult) and indicate when each procedure will be used (e.g., preflight, inflight, postflight). Assume that the crewmembers do not have a medical background or prior experience with these kinds of experiments.

**12. Does the experiment require a person to assist (operator) with data collection? If so, what procedures will be performed by this person?**

List and briefly describe each procedure separately. Be sure to rate the difficulty of learning each procedure (1= easy; 10= difficult) and indicate when each procedure will be used (e.g., preflight, inflight, postflight). Assume that the crewmembers do not have a medical background or prior experience with these kinds of experiments.

### 13. Equipment for human subject measurements

Add more lines if necessary.

#### a. Pre- and Postflight

<u>What variable will be measured?</u>	<u>Equipment Needed for Measurement</u>	<u>Equipment Provider (NASA or PI)</u>
--	---	--

1.

2.

3.

4.

#### b. Inflight (List ALL needed inflight equipment for measurement, sample collection, or storage.)

<u>What variable will be measured?</u>	<u>Equipment Needed for Measurement</u>	<u>Equipment Provider (NASA/PI)</u>
--	---	-------------------------------------

1.

2.

3.

4.

14. Is real-time data downlink either required or highly desirable? (“required” means that the experiment cannot be performed if downlink is not available; “highly desired” means that the experiment data will be downlinked if the link is available.)

15. List special requirements for specimen and/or sample accommodation or manipulation.

16. Biological samples collected on the ISS may have to be stored on the station for up to 90 days. Describe the requirements for preserving those samples (thermal control, preservatives, etc.).

**17. List each procedure that must be performed on each (crewmember) subject to meet experimental objectives. Indicate the timeframe (e.g., launch minus 60 days (+/- 5 days)) and procedure duration (e.g., 60 minutes). Specifically state if data must be collected on landing day (R+0) or if R+1 or 2 day will suffice.**

a. Pre/Postflight procedures

b. Inflight procedures

### Part III: Research Involving Non-Human Specimens

18. Use the table below to list the requirements for non-human specimens. Add more rows if necessary.

Specimen Type (e.g., species, strain, gender, weight, age)	Drugs, Tracers, Tags, etc.	Number of Specimens Required for Flight Experiment	Number of Specimens Required for Ground Control of Flight Experiment
1.			
2.			
3.			
4.			
5.			

19. Use the table below to list the required inflight experimental conditions for all non-human specimens and samples. Be sure to completely describe, for each specimen or sample, the environmental parameters (e.g., temperature, humidity, CO<sub>2</sub>, light level, atmospheric pressure) and allowable range for each parameter. Also indicate when the environmental conditions will be needed (e.g., Flight Day 3-10, mission duration, pre-injection, after fixation).

Requirement	Tolerance (e.g. $\pm 1^{\circ}\text{C}$ )	When needed?	Specimen/Sample
1.			
2.			
3.			
4.			
5.			

20. Is loading of experiment supplies or equipment less than 90 hours before launch required? If so, explain why.

21. Is removal of the experiment samples, data, or equipment less than 24 hours after landing required? If so, explain why.



**22. Describe the method for delaying experiment activation until it is installed on ISS.**

**23. Describe the method for preserving samples for up to 90 days on ISS.**

**24. What procedures will the crew need to learn to perform the experiment?**

List and briefly describe each procedure separately. Be sure to rate the difficulty of learning each procedure (1= easy; 10= difficult) and indicate when each procedure will be used (e.g., preflight, inflight, postflight).

**25. List the procedures from Item 23 in the table below. Indicate the frequency and an acceptable time range for each procedure (e.g., change media every 5 days  $\pm$  1 day, fix sample on day 10  $\pm$  6 hours).**

Procedure	Flight Day and Time (if necessary)	Frequency	Acceptable Range
1.			
2.			
3.			
4.			

**26. For each specimen, list preferred habitat or indicate NO PREFERENCE.**

**27. List equipment, tools, supplies needed for inflight experiment procedures.**

**28. List any special requirements for specimen and/or sample accommodation or manipulation.**

Principal Investigator: \_\_\_\_\_

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel.  
Photocopy this page or follow this format for each person.

NAME	POSITION TITLE
------	----------------

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training).

INSTITUTION(S) AND LOCATION	DEGREE(S) (if applicable)	YEAR(S)	FIELD(S) OF STUDY

RESEARCH AND PROFESSIONAL EXPERIENCE: Concluding with present position, list, in chronological order, previous employment, experience, and honors. Include present membership on any Federal Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past three years and to representative earlier publications pertinent to this application. If the list of publications in the last three years exceeds two pages, select the most pertinent publications. **DO NOT EXCEED TWO PAGES.**

OTHER SUPPORT

On a separate page, please provide information regarding specific sources of other support for the principal investigator and each co-investigator (not consultants). The information should be provided separately for each individual in the format shown below. Please list all active support for an individual before listing pending support. Include the label “Form E” and the principal investigator’s name at the top of each page and number pages consecutively.

NAME OF INDIVIDUAL		
ACTIVE/PENDING		
Project Number (Principal Investigator)	Dates of Approved/Proposed Project	Percent Effort
Source	Annual Direct Costs	
Title of Project (or Subproject)		
One sentence description of project goals. (The major goals of this project are...)		
Brief description of potential scientific or commitment overlap with respect to this individual between this application and projects described above(summarized for each individual).		

Principal Investigator/Program Director: \_\_\_\_\_

<b>DETAILED BUDGET FOR 12-MONTH BUDGET PERIOD DIRECT COSTS ONLY</b>			FROM		THROUGH	
Duplicate this form for each year of grant support requested			FUNDING AMOUNT REQUESTED			
PERSONNEL (Applicant Organization Only)						
NAME	ROLE IN PROJECT	EFFORT ON PROJECT	SALARY	FRINGE BENEFITS	TOTALS	
	Principal Investigator					
SUBTOTALS →						
SUBCONTRACTS						
CONSULTANT COSTS						
EQUIPMENT (Itemize, use additional sheet if needed)						
SUPPLIES (Itemize by category, use additional sheet if needed)						
TRAVEL	DOMESTIC					
	NON-DOMESTIC					
OTHER EXPENSES (Itemize by category, use additional sheet if needed)						
TOTAL DIRECT COSTS FOR FIRST 12-MONTH BUDGET PERIOD (Item 14a, Form A)						
INDIRECT COSTS FOR FIRST 12-MONTH BUDGET PERIOD						
TOTAL COST FOR FIRST 12-MONTH BUDGET PERIOD (Item 14b, Form A)						

Principal Investigator/Program Director: \_\_\_\_\_

<b>DETAILED BUDGET FOR 12-MONTH BUDGET PERIOD DIRECT COSTS ONLY</b>			FROM		THROUGH	
Duplicate this form for each year of grant support requested						
<b>PERSONNEL</b> (Applicant Organization Only)			FUNDING AMOUNT REQUESTED			
<b>NAME</b>	<b>ROLE IN PROJECT</b>	<b>EFFORT ON PROJECT</b>	<b>SALARY</b>	<b>FRINGE BENEFITS</b>	<b>TOTALS</b>	
	Principal Investigator					
SUBTOTALS →						
SUBCONTRACTS						
CONSULTANT COSTS						
EQUIPMENT (Itemize, use additional sheet if needed)						
SUPPLIES (Itemize by category, use additional sheet if needed)						
TRAVEL	DOMESTIC					
	NON-DOMESTIC					
OTHER EXPENSES (Itemize by category, use additional sheet if needed)						
<b>TOTAL DIRECT COSTS FOR FIRST 12-MONTH BUDGET PERIOD (Item 14a, Form A)</b>						
<b>INDIRECT COSTS FOR FIRST 12-MONTH BUDGET PERIOD</b>						
<b>TOTAL COST FOR FIRST 12-MONTH BUDGET PERIOD (Item 14b, Form A)</b>						

Principal Investigator/Program Director: \_\_\_\_\_

<b>DETAILED BUDGET FOR 12-MONTH BUDGET PERIOD DIRECT COSTS ONLY</b>			FROM		THROUGH	
Duplicate this form for each year of grant support requested						
<b>PERSONNEL</b> (Applicant Organization Only)			FUNDING AMOUNT REQUESTED			
<b>NAME</b>	<b>ROLE IN PROJECT</b>	<b>EFFORT ON PROJECT</b>	<b>SALARY</b>	<b>FRINGE BENEFITS</b>	<b>TOTALS</b>	
	Principal Investigator					
SUBTOTALS →						
SUBCONTRACTS						
CONSULTANT COSTS						
EQUIPMENT (Itemize, use additional sheet if needed)						
SUPPLIES (Itemize by category, use additional sheet if needed)						
TRAVEL	DOMESTIC					
	NON-DOMESTIC					
OTHER EXPENSES (Itemize by category, use additional sheet if needed)						
<b>TOTAL DIRECT COSTS FOR FIRST 12-MONTH BUDGET PERIOD (Item 14a, Form A)</b>						
<b>INDIRECT COSTS FOR FIRST 12-MONTH BUDGET PERIOD</b>						
<b>TOTAL COST FOR FIRST 12-MONTH BUDGET PERIOD (Item 14b, Form A)</b>						

Principal Investigator/Program Director: \_\_\_\_\_

<b>BUDGET FOR ENTIRE PROJECT PERIOD DIRECT COSTS ONLY</b>				
<b>BUDGET CATEGORY TOTALS</b>		<b>1<sup>st</sup> BUDGET PERIOD</b>	<b>ADDITIONAL YEARS OF SUPPORT REQUESTED</b>	
			<b>2<sup>nd</sup></b>	<b>3<sup>rd</sup></b>
PERSONNEL (Salary and Fringe Benefits) (Applicant organization only)				
SUBCONTRACTS				
CONSULTANT COSTS				
EQUIPMENT				
SUPPLIES				
TRAVEL	DOMESTIC			
	NON-DOMESTIC			
OTHER EXPENSES				
<b>TOTAL DIRECT COSTS FOR EACH PERIOD</b>				
<b>TOTAL INDIRECT COSTS FOR EACH PERIOD</b>				
<b>TOTAL DIRECT + INDIRECT COSTS FOR EACH PERIOD</b>				
<b>TOTAL DIRECT + INDIRECT COSTS FOR ENTIRE PROJECT</b>				

JUSTIFICATION FOR UNUSUAL EXPENSES (Detail Justification in Cost Section of Proposal)

**CHECKLIST FOR PROPOSERS**

This checklist should be annotated to indicate that the stated items have been included in the proposal package.

---

Principal Investigator/Program Director:

- |   |   |
|---|---|
| <input type="checkbox"/> Form A: Solicited Proposal Application*                | <input type="checkbox"/> Form E: Other Support  |
| <input type="checkbox"/> Form B: Proposal Abstract                              | <input type="checkbox"/> Facilities and Equipment Description                               |
| <input type="checkbox"/> Title Page   | <input type="checkbox"/> IRB or ACUC letter/form (if applicable)*                           |
| <input type="checkbox"/> Project Description                                    | <input type="checkbox"/> Form F: Detailed 12 Month Budget (1 <sup>st</sup> year of support) |
| <input type="checkbox"/> Form C: Space Flight Experiment Requirements Summary   | <input type="checkbox"/> Form G: Summary Budget Form  |
| <input type="checkbox"/> Management Approach                                    | <input type="checkbox"/> Supporting Budgetary Information                                   |
| <input type="checkbox"/> Letter of Assurance of Foreign Support (if applicable) | <input type="checkbox"/> Appendices, if any   |
| <input type="checkbox"/> Form D: Biographical Sketches                          | <input type="checkbox"/> 25 copies of all material listed above                             |

\* One signed original required

---

Only one copy of the following needs to be submitted:

- ☐ 3.5 inch computer diskette
- ☐ Form H: This checklist indicates all applicable items have been enclosed.